What is claimed is:

1. A method of detecting one or more biomarkers of a rare cell type in a sample containing a mixed population of cells, the method comprising the steps of:

immunomagnetically isolating from the sample a subpopulation of cells containing a rare cell type by contacting the sample with one or more antibody compositions, each antibody composition being specific for a capture antigen and being attached to a magnetic particle;

providing a binding compound for one or more biomarkers, each binding compound having one or more molecular tags releasably attached thereto, the one or more molecular tags of each different binding compound having a distinct separation characteristic so that molecular tags of each different binding compound form distinct peaks in a separation profile upon separation;

combining with the subpopulation a binding compound for each of the plurality of biomarkers such that in the presence of a biomarker a complex is formed between each biomarker and the binding compound specific therefor;

releasing the molecular tags of each binding compound forming such a complex; and

separating and identifying the released molecular tags to determine the one or more biomarkers in the sample.

2. The method of claim 1 wherein said capture antigen is a receptor tyrosine kinase.

3. The method of claim 2 wherein said tyrosine kinase is an ErbB receptor.

4. A method of detecting one or more protein-protein complexes of a rare cell type in a sample containing a mixed population of cells such that each protein-protein complex has a first protein and a second protein, the method comprising the steps of:

immunomagnetically isolating from the sample a subpopulation of cells containing a rare cell type by contacting the sample with one or more antibody compositions, each antibody composition being specific for a capture antigen and being attached to a magnetic particle;

providing a binding compound for each first protein of each of the one or more protein-protein complexes, each binding compound having one or more molecular tags releasably attached thereto, the one or more molecular tags of each different binding compound having a distinct separation characteristic so that molecular tags of each different binding compound form distinct peaks in a separation profile upon separation;

providing a second binding compound specific for each second protein of each of the one or more protein-protein complexes, each second binding compound being conjugated to a cleaving-inducing moiety having an effective proximity;

combining with protein-protein complexes of the subpopulation, binding compounds and second binding compounds such that binding compounds specifically bind to first proteins and second binding compounds specifically bind to second proteins and such that;

releasing the molecular tags of each binding compound forming such a complex; and separating and identifying the released molecular tags to determine the one or more biomarkers in the sample.

5. The method of claim 4 wherein said protein-protein complex is a receptor dimer.

6. The method of claim 5 wherein said receptor dimer comprises one or more ErbB receptors.

7. The method of claim 4 wherein said protein-protein complex comprises one or more ErbB receptors or comprises PI3K.

8. The method of claim 7 wherein said protein-protein complex is selected from the group consisting of Her1//Shc, Her2//Shc, Her3//Shc, Her3//PI3K, and IGF-1R//PI3K.